MERI College of Engineering and Technology
(MERI - CET)

Session: 2020-21

Lesson Plan

Name of the Faculty : Mr. Sandeep Chhillar (Theory & Practical)

Discipline : Mechanical Engineering

Semester : 7th

Subject : Mechanical Vibration (ME-409-F)

Lesson Plan Duration : 15 Weeks (from Aug., 2020 to Nov., 2020)

** Work Load (Lecture/Practical) per week (in hours): Lectures-02, Practicals-00

Week	Theory		Practical	
	Lecture Day	Topic (including assignment/test)	Practical day	Topic
1st	1st	Importance of Study of Vibrations, Classifications of Vibrations, Free and Forced, Undamped and Damped, Linear and Non-linear, Deterministic and Random	No Practical's	
	2nd	Harmonic Motion, Vector and Complex Number Representations, Definitions and Terminology, Periodic functions		
2nd	3rd	Harmonic Analysis and its numerical, Fourier Series Expansion, its numerical and 1st Assignment		
	4th	Single Degree of Freedom system, D-Alembert's Principal		
3rd	5th	Energy Methods, Rayleigh's Method, Application of these Methods		
	6th	Damped Free Vibrations, Logarithmic Decrement		
4th	7th	Under Damping, Critical Damping, Over Damping, Coulomb Damping.		

	8th	Related numerical and 2nd Assignment, Forced Damped Harmonic Vibration of Single		
5th	9th	Degree of Freedom Systems and Checking of both Assignment Rotating Unbalance, Rotor Unbalance		
	10th	Critical Speeds and Whirling of Rotating Shafts and 3rd Assignment		
6th	11th	Support Motion, Vibration Isolation, Energy Dissipated by Damping, Equivalent		
	12th	Viscous Camping, Structural Damping Sharpness of Resonance, Vibration Measuring Instruments and 4th Assignment		
7th	13th	Transient Vibrations : Impulse Excitation, Arbitrary Excitation, Response to Step Excitations		
	14th	Base Excitation Solution by Laplace Transforms, Response Spectrum, Runge-Kutta Method and 5th Assignment		
8th	15th	**Two Degrees of Freedom Systems :** Introduction to Multi-Degree of Freedom Systems		
	16th	Normal Mode Vibrations, Coordinate Coupling		
9th	17th	Principal Coordinates, Free Vibrations in Terms of Initial Conditions		
	18th	Forced Harmonic Vibrations, Vibration Absorber		
10th	19th	Centrifugal Vibration Absorber, Vibration Damper and 6th Assignment		
	20th	**Multi degrees of Freedom Systems and Numerical Methods :** Introduction, Influence Coefficients		
11th	21st	Stiffness Matrix, Flexibility Matrix		
	22nd	Natural Frequencies and Normal Modes, Orthogonally of Normal Modes		

12th	23rd	Dun Kerley's Equation, Method of Matrix Iteration		
	24th	The Holzer Type Problem, Geared and Branched Systems, Beams and 8th Assignment		
13th	25th	**Vibration of Continuous System:** Vibrating String		
	26th	Longitudinal Vibrations of Rod		
14th	27th	Torsional Vibrations of Rod		
	28th	Lateral Vibrations of Beam and 9th Assignment		